

Patent claims

1. Closure device (1) that can be provided over a pierceable point of a closed container (B), the container being made of laminated paper or cardboard and comprising at least one layer of plastics film, the device being made of plastics material and comprising a stopper-like lower part (2) with a cylindrical outlet connecting piece (20), which is connected or can be connected to the container, and a screw cap (4) which can be screwed onto the lower part (2), and a cylindrical piercing element (3) which is open on both sides in the axial direction and is displaceably mounted in the manner of a screw in the lower part, means (44) being provided in the screw cap (4) which move the piercing element (3) downwards in a helical manner on the first unscrewing movement of the screw cap, the cylindrical piercing element (3) comprising a ring (31) with external thread (32) and at least one cutting element (33) directed toward the container, characterised in that in the cutting direction (S) at least one perforating tooth (38) is arranged so as to be successive to a cutting region of the cutting element (33) and so as to be successive with respect to the penetrating direction (E) of the leading tip (36) of the cutting element (33), which tooth, in the event that the at least one plastics film layer is not cut through, pierces the extended and stretched plastics film layer.
2. Closure device according to Claim 1, characterised in that the cylindrical piercing element (3) comprises only one cutting element (33) and the at least one perforating tooth (38) is arranged on the edge (35) following the foremost tip (36) and descending toward the ring.
3. Closure device according to Claim 2, characterised in that the at least one perforating tooth (38) is arranged on an elevation (39) on the descending edge (35).
4. Closure device according to Claim 1, characterised in that the cylindrical piercing element (3) comprises a plurality of cutting elements (33), at least one cutting element comprising at least one perforating tooth (38) on the edge (35) following the foremost tip (36) and descending toward the ring.
5. Closure device according to Claim 4, characterised in that at least two cutting elements are, with their respective foremost tip (36), arranged at an at least approximately equal distance (N) from the nearest edge of the ring (31) in each case.

6. Closure device according to Claim 1, characterised in that the cylindrical piercing element (3) comprises a deflector (34) following the at least one cutting element (33) in the cutting direction.

7. Closure device according to Claim 1, characterised in that the deflector (34) is combined with a cutting element (33) and is formed as a configuration of the descending edge (35).

8. Closure device according to Claim 7, characterised in that the at least one perforating tooth (38) is arranged on the deflector (34).

9. Closure device according to Claim 5, characterised in that there is a separate deflector (34) formed on the ring following the at least two cutting elements (33) in the cutting direction, the deflector comprising a perforating tooth (38) at the point most remote from the nearest edge of the ring (31).

10. Closure device according to any one of Claims 6 to 9, characterised in that the height of the deflector (34) is lower in the direction of penetration (E) than the height of all of the cutting elements (33).